

**IN THE UNITED STATES PATENT
AND TRADEMARK OFFICE**

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PROTECTOR FOR AUTOMOBILES

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1 **I. TITLE: " *PROTECTOR FOR AUTOMOBILES* "**

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3 **II. BACKGROUND OF THE INVENTION**

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5 **1. Field of the Invention.**

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7 The present invention relates to a protector for automobiles, and
8 more particularly, to a protector to be used with vehicles doors to protect a
9 user from the elements (rain, snow, etc.) as he or she opens the door.

10

11 **2. Description of the Related Art.**

12

13 Several designs for protectors for automobile have been developed in
14 the past. None of them, however, includes the use of frustro-conical
15 members that reel in a protective sheet taking into consideration the
16 differences in linear distension of the sheet as a formation of the separation
17 from the hinges' point.

18

19 Applicant believes that the closest reference corresponds to U.S.
20 patent No. 5,476,302 issued to Michael B. Ronci on December 19, 1995 for a
21 cover for car door. Ronci's patented invention includes a cover for an
22 automobile that is attached at one end to a (straight) roller, and at the other
23 end to attachment points at the top of the door. Ronci's patent mentions
24 that when the door is closed, the fabric is rolled unto the roller. However,
25 there is no disclosure as to how the fabric is rolled unto the roller and what
26 mechanism makes the invention work. It is clear Ronci's patented
27 invention does not take into consideration the different magnitudes of

1 distension or advancement of the fabric as the distance from the pivoting
2 axis varies.

3
4 Other patents describing the closest subject matter provide for a
5 number of more or less complicated features that fail to solve the problem
6 in an efficient and economical way. None of these patents suggest the
7 novel features of the present invention.

8 9 III. SUMMARY OF THE INVENTION

10
11 It is one of the main objects of the present invention to provide a
12 protector for automobiles that protects a user from the elements (rain,
13 snow, etc.) when the door is opened and the user gets ready to get off the
14 vehicle.

15
16 It is another object of this invention to provide a protector for
17 vehicles that can be adjusted to almost any door size.

18
19 It is still another object of the present invention to provide a protector
20 for automobiles with a self-roller and unrolling mechanism.

21
22 It is yet another object of this invention to provide such a device that
23 is inexpensive to manufacture and maintain while retaining its
24 effectiveness.

25
26 Further objects of the invention will be brought out in the following
27 part of the specification, wherein detailed description is for the purpose of
28 fully disclosing the invention without placing limitations thereon.

IV. BRIEF DESCRIPTION OF THE DRAWINGS

With the above and other related objects in view, the invention consists in the details of construction and combination of parts as will be more fully understood from the following description, when read in conjunction with the accompanying drawings in which:

Figure 1 represents an isometric view of the protector for automobiles object of the present application.

Figure 2 shows a cross-section view taken from figure 1 along lines 2-2 showing configuration of the preferred embodiment for the protector object of the present application.

Figure 3 is a front isometric view of the preferred embodiment for the frustro-conical roller sections.

Figure 4 illustrates a side elevational view of the frustro-conical roller section represented in figure 3, showing the peripheral channel and notch.

Figure 5 shows a front isometric view for the rolling-unrolling mechanism used with the present invention, mounted to the axle, showing the bushing member with its peripheral ridge, the rib and the spring.

Figure 6 illustrates an isometric view of the rolled protector for automobiles mounted to an automobile door opening.

1 **Figure 7** is a representation of an isometric view of the open protector
2 for automobiles mounted to an automobile door.

3 4 **V. DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

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6 Referring now to the drawings, where the present invention is
7 generally referred to with numeral **10**, it can be observed that it basically
8 includes two-sectioned frustro-conical roller assembly **20** with rollable
9 sheet **40**, as seen in figures 1 and 2.

10
11 Depending on the characteristics and dimensions of the vehicle's
12 door to be protected, frustro-conical roller assembly **20** can include on or
13 more frustro-conical roller members to substantially follow the upper
14 contour of the door. In this application the door shown in figures 6 and 7 is
15 used. For a completely square door only one roller member is needed. The
16 one shown requires the use of two roller members since one portion is
17 substantially horizontal and the other one is slanted. The dimensions of
18 the frustro-conical members are selected so that the different linear
19 advance of flexible rollable sheet **40** is taken into consideration as the
20 distance from the pivoting axis of the door varies. In other words closer to
21 this axis the distance that rollable sheet **40** has to travel is less than at the
22 distal end of the door **D**.

23
24 Frustro-conical roller assembly **20** includes, in the preferred
25 embodiment, frustro-conical roller members **22** and **122**. As best seen in
26 the cross-section represented in figure 2, roller member **22** has a larger
27 diameter at the end **24**. When it is installed, as seen in figures 6 and 7, end
28 **24** is positioned to correspond with the distal end of door **D**. In the

1 preferred embodiment, member 22 includes central through opening 30
2 that receives axle member 62. The dimensions of member 22 are selected to
3 take into consideration the longer advancement of rollable sheet section 42
4 towards end 24 with respect to end 28. Axle member 62 is rigidly
5 supported to horizontal upper frame portion U of a car door opening.
6 Spring member 82 is also housed within opening 30 to bias roller member
7 22. Spring member 82 is anchored to cylinder 98 of rolling-unrolling
8 supporting mechanism 80 at one end 84 and to axle 62 at the other end 86.
9 As roller member 22 is rotated by pulling rollable sheet section 42, torsion
10 energy is stored in spring member 82. This energy is later used to pull in
11 rollable sheet section 42.

12
13 Similarly, frustro-conical roller member 122 operates with spring
14 member 182 to store the necessary torsion energy to retrieve rollable sheet
15 section 142. The dimensions of member 122 are selected to take into
16 consideration the longer advancement of rollable sheet section 142 towards
17 lateral end 124 with respect to lateral end 128. Again, axle member 162 is
18 rigidly supported to upper inner portion I of a car door opening.

19
20 Rollable sheet 40 includes rollable sheet sections 42 and 142. Rollable
21 sheet section 42 (and 142) includes lateral ends 44, 45, 48 and 49 (and 144,
22 145, 148 and 149). Lateral end 45 (and 145) is straight and affixed to
23 frustro-conical roller member 22 (and 122). Lateral end 49 (and 149) is
24 straight. Lateral ends 44 and 48 (and 144 and 148) are cooperatively
25 curved. Lateral end 44 (and 144) extends for a predetermined longer
26 distance than lateral end 48 (and 148).

1 Mounting assembly 59 removably mounts lateral end 49 to upper
2 frame portion U of car door D. When a user open car door D, rollable
3 sheet 42 is unrolled substantially covering the area adjacent to the door's
4 opening. Mounting assembly 159 removably mounts lateral end 149 to the
5 upper inner portion I of car door D. When a user opens car door D,
6 rollable sheet 142 is unrolled substantially covering the area adjacent to the
7 door's opening. Mounting assemblies 59 and 159 may be implemented
8 with hooks and rings or with any male and female hook members such as
9 Velcro. Velcro is a trademark of Velcro Industries B.V., a limited liability
10 company of Netherlands.

11
12 In the preferred embodiment, rollable sheets 42 and 142 are
13 contiguous and include zipper assembly 50 for releasably joining lateral
14 end 48 of rollable sheet 42 with lateral end 144 of contiguous rollable sheet
15 142. Lateral ends 48 and 144 may also include, in another preferred
16 embodiment, male and female hook means 58 and 158, respectively.
17 Figure 2 best shows slider assembly 50 for joining lateral end 48 and 144.

18
19 Rollable sheet sections 42 and 142 may also be joined with other
20 means such as a Ziploc or Velcro. Ziploc is a trademark of S.C. Johnson
21 Home Storage, Inc. a Delaware corporation.

22
23 Axle 60 has two sections including axle members 62 and 162 with the
24 same shape and dimensions. Axle member 62 includes ends 64 and 68, and
25 is fixedly mounted to horizontal upper frame portion U of a car door
26 opening. Axle member 62 passes through central opening 30 of horizontal
27 frustro-conical roller section 22. Axle member 162 includes ends 164 and
28 168, fixedly mounted to upper inner portion I of the car door opening.

1 Axle member 162 passes through central opening 130 of frustro-conical
2 roller section 122.

3
4 Spring member 82 (and 182) is mounted to end 24 (and 124) of
5 frustro-conical roller member 20 (and 120) and to axle member 62 (and
6 162), as best seen in figure 5. Spring member 82 (and 182) urges rollable
7 sheet member 42 (and 142) to roll back after being rolled out. Rolling-
8 unrolling supporting mechanism 80 (and 180) includes, in the preferred
9 embodiment, spring member 82 (and 182) and bushing member 90 (and
10 190). Bushing member 90 (and 190) includes peripheral ridge 92 (and 192),
11 central through opening 94 (and 194), rib 96 (and 196) and cylinder 98 (and
12 198). Spring member 82 (and 182) is mounted to axle member 62 (and
13 162). Spring member 82 (and 182) includes ends 84 and 86 (184 and 186).
14 End 84 (and 184) is fixed to a predetermined point of axle member 62 (and
15 162). End 86 (and 186) is fixed to cylinder 98 (and 198) of bushing member
16 90 (and 190). Axle member 62 (and 162) passes through the center of
17 spring member 82 (and 182) and through opening 94 (and 194). Peripheral
18 ridge 92 (and 192) removable engages in notch 25 (and 125) of frustro-
19 conical roller section 22 (and 122). Rib 96 (and 196) is removably mounted
20 to peripheral channel 26 (and 126). When the user pulls outer lateral end
21 49 (and 149) of rollable sheet section 42 (and 142), roller section 22 (and
22 122), fixed to bushing member 90 (and 190), rotates. Then, spring 82 (and
23 182) is torqued. The weight of the car door is greater than the spring
24 torque, so rollable sheet section 42 (and 142) will be rolled up only when
25 the car door is closed or rollable sheet section 42 (and 142) is removed from
26 car door D.

1 The foregoing description conveys the best understanding of the
2 objectives and advantages of the present invention. Different embodiments
3 may be made of the inventive concept of this invention. It is to be
4 understood that all matter disclosed herein is to be interpreted merely as
5 illustrative, and not in a limiting sense.